

REMARKS

After entry of the present amendment, claims 1 through 15 will be pending in the application with claim 1 written in independent form. Claims 1 through 3 have been amended. Claims 16 through 31 have been previously withdrawn. No new matter has been added to the claims.

Claims

Claim Rejections – 35 U.S.C. §103

Claims 1 through 15 stand rejected under 35 U.S.C. §103 (a) as being unpatentable over the United States Patent No. 6,881,520 to Li et al. (the ***Li reference***) in view of the United States Patent No. 6,787,232 to Chiang *et al.* (the ***Chiang reference***). Claims 1, and 12 through 14 stand rejected under 35 U.S.C. §103 (a) as being unpatentable over the United States Patent No. 6,242,134 to Fujiwara *et al.* (the ***Fujiwara reference***) in view of the ***Chiang reference***. The Applicant believes that, as amended, the independent claim 1 and the dependent claims 2 and 3 overcome the aforementioned rejections.

The Applicant has amended independent claim 1 to further define that unlike the method taught by the aforementioned prior art references, the Applicant's method is directed to ***pretreating*** a positive electrode material for use in a cell of a lithium, lithium-ion or lithium-ion polymer battery, including the steps of subjecting a lithiated transition metal oxide positive electrode material having one or more ***hydrolysis product*** compounds therein to a treatment prior to preparing said cell to convert at least a portion of the ***hydrolysis product*** compounds to one or more water-free compounds, wherein the treatment includes exposing the positive electrode material at a temperature of 0-650°C to a CO₂-containing gas having a partial pressure of CO₂ in the range of 0.0001-100 atm; and heating the positive electrode material to a temperature of at least 250°C in the presence of an oxygen-containing

gas having a partial pressure of O₂ in the range of 0.01-99 atm. Dependent claims 2 and 3 dependent upon the amended independent claim 1 have been amended to coincide with the amended independent claim 1 wherein all amendments are supported by the specification as originally filed by the Applicant.

All of the aforementioned prior art references teach the preparation of lithiated metal oxides from starting materials, such as hydrated transition metal nitrates, acetates, or other salts, in the presence of hydrated lithium hydroxides. As amended, the independent claim 1 clarifies that the Applicant's method *does not synthesize* the oxide. The Applicant's method of cleaning the surface of "water releasing compounds" is completely different from synthesizing a lithiated oxide as starting material. The Applicant's method relates to surface bound species.

Referring now to the *Li reference*, the Examiner states that the use of CO₂ in the gas stream for the reaction of LiNiO₂ and Co(NO₃)₂·6H₂O is mentioned in column 6 lines 57 – 60, which involves physically mixing a starting material and a single metal containing lithiated oxide, which is totally different from the Applicant's invention. Furthermore, the *Li reference* does not teach the use of carbon dioxide, and the temperature ranges as set forth in the Applicant's method. In fact, as set forth in column 6 line 60, it is implied that pure oxygen is used ("a stream of oxygen"), completely teaching away from the Applicant's invention.

Alluding to the above, the *Chiang reference*, cited by the Examiner, teaches the synthesis of lithiated mixed metal oxides, which begins with mixtures of LiOH·H₂O and hydrated metal nitrates to produce the desired intercalation product, using mixed gas systems are using argon/oxygen *or* CO/CO₂ as the atmosphere for firing. In all examples, the *Chiang reference* uses temperatures well above the ranges as set forth in the Applicant's invention.

The *Chiang reference* teaches formation of synthesized materials with segregated metals within the crystal structure by using mixtures of CO/CO₂ or argon/O₂ or both. *Arguendo*, if one skilled in the art would consider that the method of the *Chiang reference* starts from a nitrate and use of completely gas mixtures, different from the Applicant's inventive method, which uses a finished material and not the hydrated nitrates or other synthetic starting materials for the lithiated oxides. Combination the *Chiang* and *Li references* will teach away from the Applicant's invention, which claims pretreating already made lithiated mixed-metal oxide.

Alluding to the above, the *Fujiwara reference* teaches yet a third method of preparing a lithiated, mixed transition metal oxide by using a three step synthesis to prepare the mixed transition metal oxides by first precipitating the mixed metal hydroxide, thermally decomposing the hydroxide to an oxide at 700 °C, then bulk mixing the resulting oxide with lithium hydroxide and firing this mixture at 700 °C, again. These temperatures were where the best materials could be made, but others were tried, as alluded by the Examiner. Again, the *Fujiwara reference* teaches preparation of the positive electrode active material *de novo*.

For the reasons set forth above, the Applicant respectfully submits that independent claim 1 is in condition for allowance. Dependent claims 2 through 15 dependent upon claim 1 as alluded to the Applicant's amendments and arguments above.

Applicant: Manev, et al.
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The application is now in condition for allowance, which allowance is respectfully solicited. No additional fees are required, however, the Commissioner is authorized to charge our Deposit Account No. 08-2789 for any fees or credit the account for any overpayment.

Respectfully submitted,

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